

SUPPLEMENTAL Response

Applicant: W. Wistar Rhoads et al.

Serial No.: 09/859,692

Filed: May 17, 2001

Docket No.: 10961133-6

Title: SERVICING SYSTEM FOR AN INKJET PRINthead

IN THE CLAIMS

Claims 6, 32-38, and 46-50 have been cancelled in this Reissue application.

Claims 27-31, 39-45, and 51 have been added in this Reissue application as follows.

Claims 1-5, 7-16, and 24-26 have been amended in this Reissue application as follows.

1. (Thrice Amended) A [wet wiping] system for servicing a printhead having an orifice plate, comprising:

a moveable container having a reservoir [of] for treatment fluid disposed therein;

a first block of porous material disposed within said moveable container for absorbing treatment fluid by capillary action [said reservoir of treatment fluid];

[another] a second block of porous material partially disposed within said moveable container and extending outwardly therefrom a sufficient distance to facilitate transfer of treatment fluid to the orifice plate when said moveable container and printhead move relative to one another;

said [another] second block of porous material having substantially greater capillary action than said first block of porous material so that a distal end portion of [the another] said second block [is] may be continuously supplied with treatment fluid from said reservoir for facilitating the transfer of treatment fluid to the orifice plate; and

a wiper mounted adjacent said moveable container for engaging the orifice plate when said moveable container and printhead move relative to one another;

said moveable container and printhead moving a sufficient distance relative to one another in at least one [relative axes] direction so that a sufficient amount of the treatment fluid from said distal end portion [of a transfer element is] may be transferred to the orifice plate for transporting dried printhead residue therefrom as said wiper engagingly travels across the orifice plate; and

wherein said first block of porous material [is a block of open cell foam that] substantially fills said moveable container.

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2. (Thrice Amended) [A wet wiping] The system [according to] of claim 1, wherein said [another] distal end portion of said second block of porous [materials] material includes an applicator, said applicator having a first portion in fluid communication with said reservoir to draw fluid from said reservoir, and said applicator having a tip configured and positioned for directly contacting at least one of said elements to apply a reproducible quantity of servicing fluid onto said at least one element, servicing fluid being transferred to the tip of the applicator by capillary action and said applicator being located adjacent to [said] a cap.

3. (Amended) The system of claim 2, wherein said [applicator] distal end portion contacts said printhead when said printhead is capped.

4. (Twice Amended) The system of claim 3, wherein said printer further comprises a reciprocally moveable carriage for carrying the printhead, said carriage being moveable between a first limit and a second limit of travel along a guide rod,

wherein said [applicator] moveable container is mounted for movement on said guide rod to apply treatment fluid to said wiper as said [applicator] moveable container is moved along said rod by contact with said carriage.

5. (Amended) The system of claim 3, wherein said [applicator] distal end portion is located within said cap.

Cancel claim 6.

7. (Twice Amended) The system of claim [6] 4, further comprising:
a biasing [spring] member for biasing said [applicator] moveable container to a certain position adjacent a certain side of said wiper.

8. (Amended) The system of claim 2, wherein said [applicator] wiper further comprises a first wiper having an applicator portion.

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9. (Amended) The system of claim 8, wherein said first wiper is flexed by contact with said printhead to move said applicator portion into engagement with said [applicator] distal end portion of said second block of porous material.

10. (Amended) The system of claim 9, further comprising a second wiper adjacent said [applicator] distal end portion on a side opposite said first wiper, whereby said [printhead is] orifice plate may be wiped by said second wiper prior to application of servicing fluid to said [printhead] orifice plate by said applicator portion of said first wiper.

11. (Amended) [A wet wiping] The system [according to] of claim 1, wherein said first block [of open cell foam] is elastomeric open cell foam.

12. (Thrice Amended) [A wet wiping] The system [according to] of claim 1, wherein said moveable container includes a [small] vent [hole] for allowing air to enter said moveable container as fluid is withdrawn therefrom by capillary action.

13. (Amended) [A wet wiping] The system [according to] of claim [1] 10, wherein said [another] second block of porous material is disposed in a space between said wiper and said transfer [element] portion.

14. (Amended) [A wet wiping] The system [according to] of claim 13, wherein said transfer [element] portion squeezes said [another] second block of porous material when moved laterally by said printhead with a sufficient amount of force to cause said sufficient amount of treatment fluid to expel upwardly from said distal end portion onto said first wiper for subsequent engagement with said orifice plate as said printhead moves along a given path of travel into wiping engagement with said wiper.

15. (Amended) [A wet wiping] The system [according to] of claim 14, wherein said transfer [element] portion is [an] elastomeric [transfer element].

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16. (Amended) A system for servicing a portion of a printhead of an inkjet [printer] printing mechanism having a printhead reciprocally moved by a carriage, a cap for capping said printhead and a wiper [positioned to move with respect to the] for wiping said printhead [in wiping contact therewith to remove unwanted accumulations when the printhead and the wiper are moved with respect to each other by movement of at least one of two elements consisting of the printhead and the wiper] during relative movement of said printhead and said wiper, said system comprising:

a source of printhead servicing fluid including a fluid reservoir; and

an applicator [at least partially formed of a wicking material having a first portion] in fluid communication with said reservoir to draw fluid from said reservoir, and said applicator having a tip configured and positioned for directly contacting [at least one of said elements] said wiper to apply a reproducible quantity of servicing fluid onto said [at least one element] wiper, servicing fluid being transferred to the tip of the applicator by capillary action [and said applicator being located adjacent to said cap];

wherein said printer further comprises:

a reciprocally movable carriage which moves between a first limit and a second limit of travel along a guide rod, and a printhead carried by said carriage wherein said applicator is carried by said guide rod so as to move with a printer carriage to wipingly contact said wiper element;

wherein said source of servicing fluid is stationary and is mounted adjacent a path of travel of said printhead carriage; [and]

a pump for pumping servicing fluid from said source to said applicator; and

wherein the pump is actuated by movement of said carriage, said applicator being dosed by moving the carriage to a position to actuate said pump and in a coordinated manner moving the applicator to a position where said applicator receives said treatment fluid pumped from said stationary source of servicing fluid.

17. The system of claim 16, wherein said pump is located at a limit of reciprocal movement of the carriage and further comprising a spigot in fluid communication with said pump, said spigot located so as to dispense servicing fluid to said applicator when said

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actuator is positioned at said limit of reciprocal movement.

18. A system for servicing a printhead of an inkjet printer, comprising:

a composite wiper element having first and second impervious elastomeric layers, and a layer of porous elastomeric foam sandwiched therebetween;

a quantity of treatment fluid disposed in said layer of porous elastomeric foam and in fluid communication with a normally open opening adjacent a top portion of said composite wiper element and allowing servicing fluid to flow out to assist in wiping said printhead by wipingly contacting the composite wiper and said printhead.

19. The system of claim 18, wherein said composite wiper is deformed resiliently by contact with said printhead to expel fluid from said opening.

20. A system for servicing a printhead element of an inkjet printer wherein two elements, consisting of said printhead and a wiper element moveable with respect to the printhead in wiping contact therewith, are moved with respect to one another to remove unwanted accumulations from a portion of the printhead comprising:

a composite wiper element having first and second impervious elastomeric layers, and a layer of fluid impregnated porous elastomeric foam sandwiched therebetween, said foam layer containing a quantity of servicing fluid therein and being in fluid communication with a normally open opening adjacent a top portion of said composite wiper element and allowing servicing fluid to flow out to assist in wiping said printhead by wipingly contacting the composite wiper and said printhead;

wherein said composite wiper is resiliently deformed by contact with said printhead to expel fluid from said opening; and

a separate source of servicing fluid in fluid communication with said porous layer to replenish the servicing fluid contained in the porous layer.

21. The system of claim 20, wherein fluid is transferred to said composite wiper from said separate source by a pumping action of said composite wiper upon rebound from

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deformation due to wiping the printhead.

22. The system of claim 21, wherein said first and second elastomeric impervious layers are of unequal height, at least one of said layers having a tapered top which is engaged by said printhead to bend said one layer to close said opening.

23. The system of claim 21, further comprising an opening adjacent a top edge of said wiper on a side first contacted by said printhead in wiping.

24. (Thrice Amended) A [wet wiping] system for servicing a printhead [having an orifice plate], comprising:

a moveable container having a reservoir of treatment fluid disposed therein;

a first block of porous material disposed within said moveable container for absorbing by capillary action said reservoir of treatment fluid;

[another] a second block of porous material partially disposed within said moveable container and extending outwardly therefrom a sufficient distance to facilitate transfer of treatment fluid to the [orifice plate] printhead when said moveable container and printhead move relative to one another;

said [another] second block of porous material having substantially greater capillary action than said first block of porous material so that a distal end portion of [the another] said second block is continuously supplied with treatment fluid from said reservoir for facilitating the transfer of treatment fluid to [the orifice plate] said printhead; and

a wiper mounted adjacent said moveable container for engaging [the orifice plate] said printhead when said moveable container and printhead move relative to one another;

said moveable container and printhead moving a sufficient distance relative to one another in at least one [relative axes] direction so that a sufficient amount of the treatment fluid from said distal end portion [of the transfer element] is transferred to [the orifice plate] said printhead for transporting dried printhead residue therefrom as said wiper engagingly travels across the orifice plate for printhead cleaning purposes.

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25. (Thrice Amended) A [wet wiping] system for servicing a printhead [having an orifice plate], comprising:

a moveable container having a reservoir of treatment fluid disposed therein;
a first block of porous material disposed within said moveable container for absorbing by capillary action said reservoir of treatment fluid;

[another] second block of porous material partially disposed within said moveable container and extending outwardly therefrom a sufficient distance to facilitate transfer of treatment fluid to [the orifice plate] said printhead when said moveable container and printhead move relative to one another;

said [another] second block of porous material having substantially greater capillary action than said first block of porous material so that a distal end portion of [the another] said second block is continuously supplied with treatment fluid from said reservoir for facilitating the transfer of treatment fluid to [the orifice plate] said printhead; and

a wiper mounted adjacent said moveable container for engaging [the orifice plate] said printhead when said moveable container and printhead move relative to one another;

said moveable container and printhead moving a sufficient distance relative to one another in at least one [relative axes] direction so that a sufficient amount of the treatment fluid from said distal end portion [of a transfer element] is transferred to [the orifice plate] said printhead for transporting dried printhead residue therefrom as said wiper engagingly travels across [the orifice plate] said printhead; and

wherein said [another] second block engages [the orifice plate] said printhead when said moveable container and printhead are moved [relative] toward one another in a vertical direction [only].

26. (Twice Amended) A wet wiping system for a printhead [having an orifice plate], comprising:

a moveable container having a reservoir of treatment fluid disposed therein;
a block of porous material disposed within said moveable container for absorbing by capillary action said reservoir of treatment fluid;

another block of porous material partially disposed within said moveable container and extending outwardly therefrom a sufficient distance to facilitate transfer of treatment

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fluid to [the orifice plate] said printhead when said moveable container and printhead move relative to one another;

 said another block of porous material having substantially greater capillary action than said block of porous material so that a distal end portion of the another block is continuously supplied with treatment fluid from said reservoir for facilitating the transfer of treatment fluid to [the orifice plate] said printhead; and

 a wiper mounted adjacent said moveable container for engaging [the orifice plate] said printhead when said moveable container and printhead move relative to one another;

 said movable container and printhead moving a sufficient distance relative to one another in at least one [relative axes] direction so that a sufficient amount of the treatment fluid from said distal end portion of a transfer element is transferred to [the orifice plate] said printhead for transporting dried printhead residue therefrom as said wiper engagingly travels across [the orifice plate] said printhead; and

 further comprising a transfer element mounted at about said moveable container and spaced from said wiper for further facilitating the transfer of said sufficient amount of treatment fluid to [the orifice plate of the] said printhead.

27. A system for servicing a printhead of an inkjet printing mechanism, comprising:
 a service station including a cap which covers the printhead when positioned at said service station and a wiper which wipes said printhead during relative movement of said printhead and said wiper;

a source of printhead servicing fluid; and
 an applicator pump having a fluid outlet in said cap for applying a predetermined quantity of said fluid to said printhead.

28. The system of claim 27, wherein said pump is actuated by movement of said service station relative to said printhead.

29. The system of claim 28, wherein said pump includes a piston moved by contact of said cap with said printhead.

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30. The system of claim 29, wherein said outlet is a duckbill valve.

31. The system of claim 27, wherein said pump is a low volume spray pump.

Cancel claims 32-38.

39. An inkjet printing mechanism having a moveable inkjet printhead in combination with the servicing system of claim 1, said servicing system being positioned on said mechanism for servicing said printhead.

40. An inkjet printing mechanism having a moveable inkjet printhead in combination with the servicing system of claim 16, said servicing system being positioned on said mechanism for servicing said printhead.

41. An inkjet printing mechanism having a moveable inkjet printhead in combination with the servicing system of claim 18, said servicing system being positioned on said mechanism for servicing said printhead.

42. An inkjet printing mechanism having a moveable inkjet printhead in combination with the servicing system of claim 20, said servicing system being positioned on said mechanism for servicing said printhead.

43. An inkjet printing mechanism having a moveable inkjet printhead in combination with the servicing system of claim 24, said servicing system being positioned on said mechanism for servicing said printhead.

44. An inkjet printing mechanism having a moveable inkjet printhead in combination with the servicing system of claim 25, said servicing system being positioned on said mechanism for servicing said printhead.

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45. An inkjet printing mechanism having a moveable inkjet printhead in combination with the wet wiping system of claim 26, said wet wiping system being positioned on said mechanism for servicing said printhead.

Cancel claims 46-50.

51. The system of claim 7, wherein said biasing member is a coil spring.